

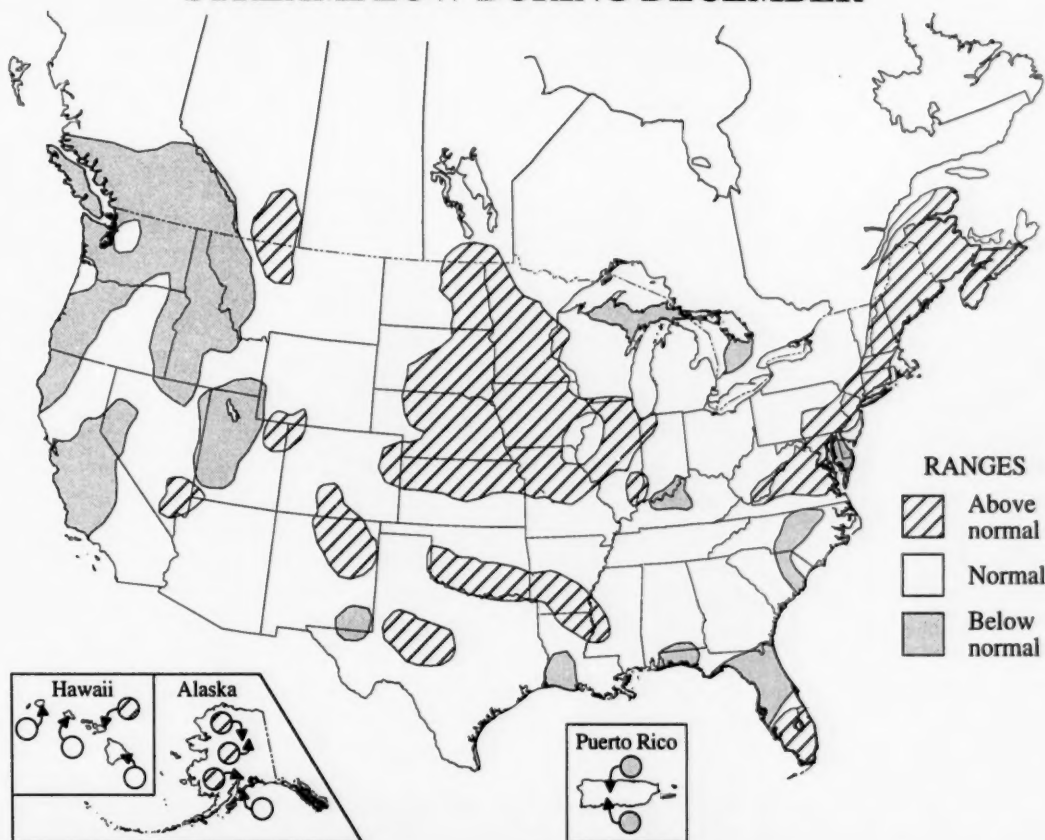
National Water Conditions

UNITED STATES
Department of the Interior
Geological Survey

CANADA
Department of the Environment
Water Resources Branch

DECEMBER 1993

STREAMFLOW DURING DECEMBER



Streamflow remains in the above-normal range for many index gaging stations in the upper and central Midwest. Streamflow has been above normal for 12 consecutive months at Saline River near Russell, Kansas, with mean monthly flow in December 1993 being the second highest December on record. Two other stations have had above-normal streamflow for 10 consecutive months and two more have been above normal for nine consecutive months.

In contrast, streamflow has been below normal in the Northwest. The Snake River at Weiser, Idaho, the Columbia River at The Dalles, Oregon, the Willamette River at Salem, Oregon, and the Chehalis River near Grand Mound, Washington, have had flow in the below-normal range for four consecutive months.

Below-normal streamflow occurred in 15 percent of the area of the conterminous United States and southern Canada during December, the same percentage as in November. Above-normal range streamflow occurred in 21 percent of this area, also the same as November.

The combined flow of the three largest rivers in the lower 48 States—the Mississippi, St. Lawrence, and Columbia Rivers—fell to normal range after 16 consecutive months above normal, despite a seasonal increase in flow from November of 30 percent.

Monthend index reservoir contents were in the below-average range at 21 of 98 reporting sites compared with 34 of 100 sites at the end of December 1992. Contents were in the above-average range at 47 sites compared with 46 a year ago. Eight reservoirs on the Upper Snake River in Idaho and Wyoming had contents at 75 percent of the normal maximum compared with 33 percent last year. International Falcon Reservoir in Texas declined from 99 percent of normal maximum in December 1992 to 64 percent this year.

Mean December elevations at the four master gages on the Great Lakes (provisional National Ocean Service data) were in the normal range and above median on Lakes Superior, Huron, and Erie, and normal but below median for Lake Ontario.

Utah's Great Salt Lake level remained constant with minor fluctuations during December, ending the month at 4,200.6 feet above National Geodetic Vertical Datum. Lake level was 0.6 foot higher than a year ago and 11.25 feet lower than the maximum of record.

CONTENTS

	Page
Streamflow (map)	1
Surface-water conditions	2
New maximums at streamflow index stations.....	3
Monthly mean discharge of selected streams (map and graphs).....	4
Hydrographs for the "Big Three" rivers - combined and individual flows (graphs).....	5
Dissolved solids and water temperatures at downstream sites on two large rivers	5
Flow of large rivers	6
Usable contents of selected reservoirs and reservoir systems (map and graphs).....	7
Usable contents of selected reservoirs and reservoir systems.....	8
Great Lakes elevations (graphs)	9
Fluctuations of the Great Salt Lake, October 1988 through December 1993 (graph).....	9
pH of precipitation for November 22-December 26, 1993	10
Distribution of precipitation-weighted mean pH for all NADP/NTN sites having one or more weekly samples for November 22-December 26, 1993 (graph).....	10
Explanation of data	11

Reporting of ground-water conditions will resume with the June 1994 edition.

SURFACE-WATER CONDITIONS DURING DECEMBER 1993

Streamflow remains in the above-normal range for many index gaging stations in the upper and central Midwest. Streamflow has been above normal for 12 consecutive months at Saline River near Russell, Kansas, with December 1993 being the second highest December on record with a mean monthly flow of 150 cubic feet per second (cfs). Streamflow on Pecatonica River at Freeport, Illinois, Missouri River at Hermann, Missouri, and Elkhorn River at Waterloo, Nebraska, has been above normal for 10 consecutive months. The Elkhorn River flow was a new maximum December monthly mean with 1,900 cfs. The Crew River at Rockford, Minnesota, and the Minnesota River near Jordan, Minnesota, have had flow in the above-normal range for nine consecutive months. A mean monthly flow of 4,840 cfs on the Minnesota River was the second highest December on record.

In the Northwest, streamflow has been below normal. The Snake River at Weiser, Idaho, the Columbia River at The Dalles, Oregon, the Willamette River at Salem, Oregon, and the Chehalis River near Grand Mound, Washington, have had flow in the below-normal range for four consecutive months.

In early December, considerable, but highly localized flash flooding occurred in the southern Ozarks, the lower Ohio Valley, and the Middle Atlantic States. Memphis,

Tennessee, reported 3.58 inches of precipitation and Knoxville, Tennessee, had 5.18 inches. During the week of December 5-11, heavy rains along the Pacific Coast again caused localized flash flooding. Over 6 inches of rain fell in Humboldt County, California, along the coastal range. Hilo, Hawaii, recorded over 7 inches of rain on December 17. Corpus Christi, Texas, reported 4.40 inches on December 17-18.

Below-normal streamflow occurred in 15 percent of the area of the conterminous United States and southern Canada during December, the same percentage as in November. Above-normal range streamflow occurred in 21 percent of this area, also the same as in November.

New extreme December monthly mean flow occurred on the Elkhorn River at Waterloo, Nebraska, as mentioned above and also at station Chena River at Fairbanks, Alaska. The new December mean monthly maximum flow of the Chena River was 874 cfs, which was 216 percent of the December median. Hydrographs for these stations are on page 4.

The combined flow of the three largest rivers in the lower 48 States—the Mississippi, St. Lawrence, and Columbia Rivers—increased seasonally by 30 percent in December, but fell to the normal range after 16 consecutive months above normal. Combined flow was 1,248,000

NEW MAXIMUMS DURING DECEMBER 1993 AT STREAMFLOW INDEX STATIONS

Station number	Stream and place of determination	Drainage area (square miles)	Years of record	Previous December maximums (period of record)		December 1993			
				Monthly mean in cfs (year)	Daily mean in cfs (year)	Monthly mean in cfs	Percent of median	Daily mean in cfs	Day
06800500	Elkhorn River at Waterloo, Nebraska	6,900	72	1,612 (1986)	2,950 (1982)	1,900	350	2,440	6
15514000	Chena River at Fairbanks, Alaska	1,980	44	774 (1986)	920 (1971)	874	216	1,100	2

cfs, which is 35 percent above the median. Flow of the St. Lawrence River remained constant in the normal range. Flow of the Mississippi River at Vicksburg increased by 42 percent from November and was at 168 percent of median flow. The Mississippi was above normal for the sixth consecutive month. Flow in the Columbia River was 75 percent of median, despite a 14 percent increase from last month and, as mentioned above, below normal for the fourth consecutive month.

Monthend index reservoir contents were in the below-average range at 21 of 98 reporting sites compared with 34 of 100 at the end of December 1992. Contents were in the above-average range at 47 sites compared with 46 a year ago. Reservoirs were below average in parts of Texas, Idaho, Nevada, Bear Lake in Utah-Idaho, and Lake Tahoe in California-Nevada. Lake Tahoe had no usable storage compared with a December average of 46 percent of 744,600 acre-feet. Reservoirs were above average in Arizona, New Mexico, Colorado, Wyoming, Minnesota, Wisconsin, South Carolina, Maryland, New Jersey, Vermont, New Hampshire, and Maine, and in Nova Scotia in Canada. The combined contents of six reservoirs in Nova Scotia rose to 62 percent of the normal maximum in December 1993 from only 42 percent in December 1992. Eight reservoirs on the Upper Snake

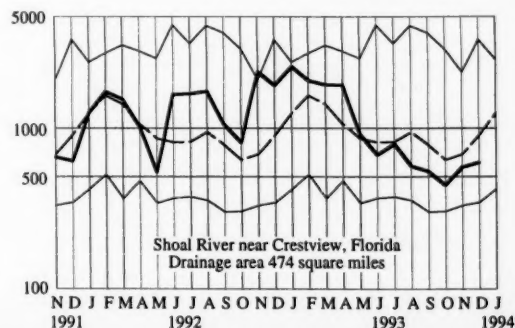
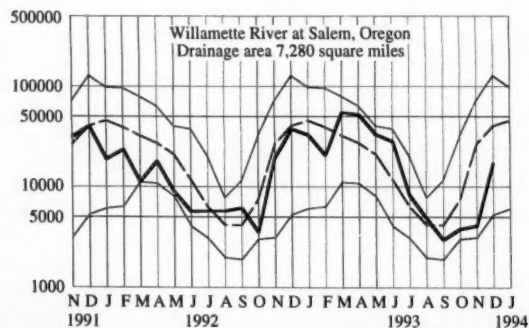
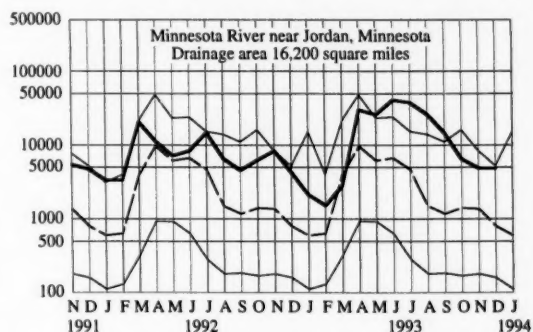
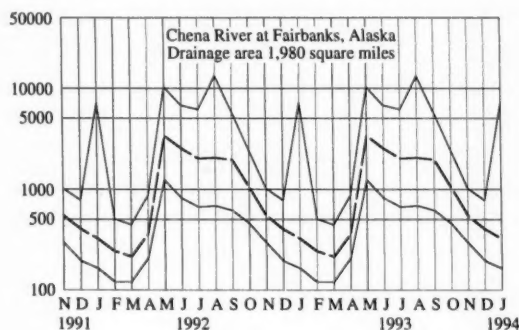
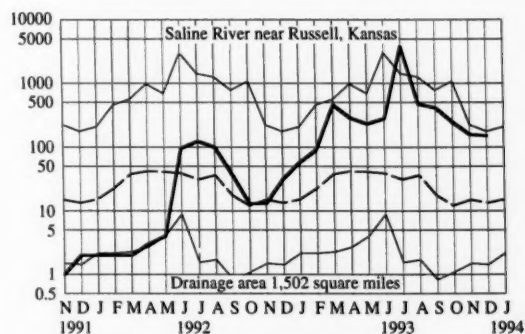
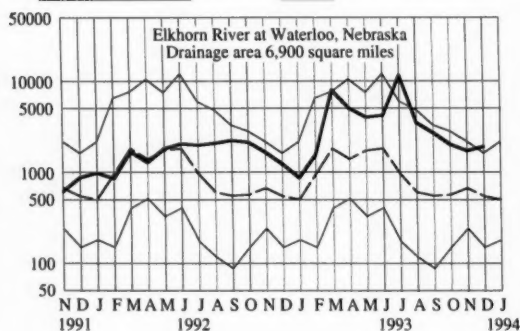
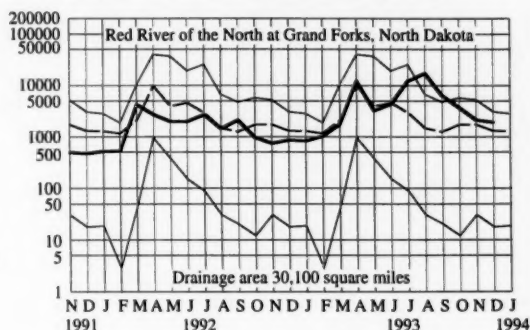
River in Idaho and Wyoming had contents at 75 percent of the normal maximum in December compared with 33 percent last year. International Falcon Reservoir and Toledo Bend Reservoir in Texas had below-average contents of 64 percent and 77 percent of normal maximum, respectively. In December 1992, International Falcon Reservoir was at 99 percent of normal maximum and Toledo Bend Reservoir was at 91 percent of normal maximum. Lake Sidney Lanier in Georgia also showed a significant decline in contents from 67 percent of normal maximum in December 1992 to only 41 percent this year.

Mean December elevations at the four master gages on the Great Lakes (provisional National Ocean Service data) were in the normal range and above median on Lakes Superior, Huron, and Erie, and normal but below median for Lake Ontario. Lakes Superior and Huron showed seasonal declines of 0.19 foot and 0.13 foot, respectively. Lakes Erie and Ontario showed seasonal increases from November of 0.16 foot for both Lakes.

Utah's Great Salt Lake level remained constant with minor fluctuations during December 1993, ending the month at 4,200.6 feet above National Geodetic Vertical Datum. This level is 0.6 foot higher than a year ago and 11.25 feet lower than the maximum of record, which occurred in June 1986 and March-April 1987.

MONTHLY MEAN DISCHARGE OF SELECTED STREAMS

Area between light-weight solid lines indicates range between highest and lowest record for the month. Dashed line indicates median of monthly values for reference period 1961-90. Heavy line indicates mean for current period.

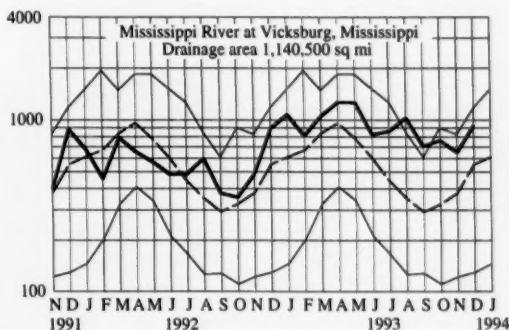
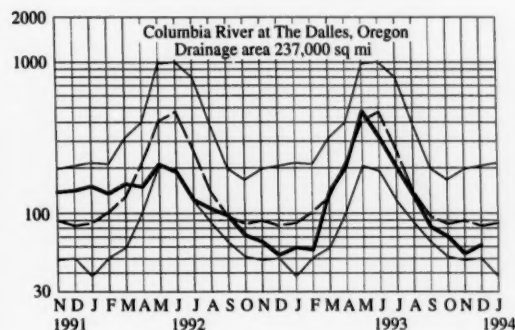
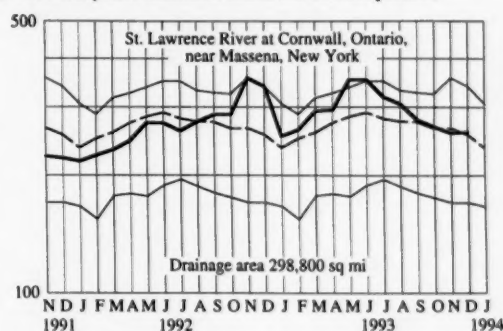
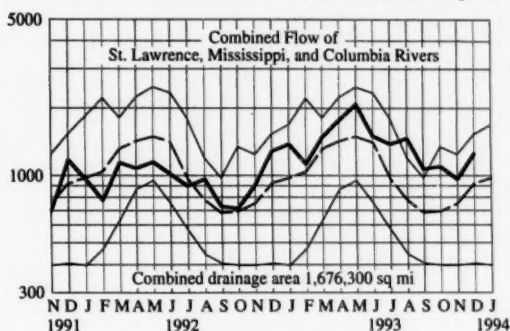


DISCHARGE, IN CUBIC FEET PER SECOND

HYDROGRAPHS FOR THE "BIG THREE" RIVERS

Area between light-weight solid lines indicates range between highest and lowest record for the month. Dashed line indicates median of monthly values for reference period 1961-90. Heavy line indicates mean for current period.

DISCHARGE, IN THOUSAND CUBIC FEET PER SECOND



Provisional data; subject to revision

DISSOLVED SOLIDS AND WATER TEMPERATURES FOR DECEMBER 1993 AT DOWNSTREAM SITES ON TWO LARGE RIVERS

Station number	Station name	December data of following calendar years	Stream discharge during month Mean (ft ³ /s)	Dissolved-solids concentration ¹		Dissolved-solids discharge ¹			Water temperature ²		
				Mini-	Maxi-	Mean	Mini-	Maxi-	Mean	Mini-	Maxi-
				mum	mum		mum	mum		mum	mum
				(mg/L)	(mg/L)		(tons per day)		(°C)	(°C)	(°C)
01463500	Delaware River at Trenton, New Jersey, (Morrisville, Pennsylvania)	1993	20,294	68	105	4,633	2,550	11,023	3.5	0	7.0
		1945-92	13,250	62	138	33,297	463	13,440	3.5	0	12.0
		(Extreme yr)	48,541	(1983)	(1980)		(1963)	(1989)			
06934500	Missouri River at Hermann, Missouri, (60 miles west of St. Louis, Missouri)	1993	94,280	316	408	93,300	74,300	117,000	6.0	2.0	10.0
		1976-92	78,030	222	770	70,340	18,000	237,000	4.5	0	14.0
		(Extreme yr)	452,310	(1982)	(1978)		(1989)	(1982)			

¹Dissolved-solids concentrations, when not analyzed directly, are calculated on basis of measurements of specific conductance.

²To convert °C to °F: [(1.8 x °C) + 32] = °F.

³Mean for 8-year period (1983-91).

⁴Median of monthly values for 30-year reference period, water years 1961-90, for comparison with data for current month.

FLOW OF LARGE RIVERS DURING DECEMBER 1993

Station number	Stream and place of determination	Drainage area (square miles)	Average discharge through September 1991 (cubic feet per second)	December 1993						Date
				Monthly mean discharge (cubic feet per second)	Percent of median monthly discharge 1961-90	Change in discharge from previous month (percent)	Discharge near end of month			
							Cubic feet per second	Million gallons per day		
01014000	St. John River below Fish River at Fort Kent, Maine ...	5,665	9,693	* 9,610	192	-19	4,250	2,750	31	
01318500	Hudson River at Hadley, New York.....	1,664	2,925	2,480	108	11	1,630	1,050	31	
01357500	Mohawk River at Cohoes, New York.....	3,456	5,673	6,940	135	11	2,810	1,820	31	
01463500	Delaware River at Trenton, New Jersey.....	6,780	11,660	* 20,290	238	72	9,330	6,030	31	
01570500	Susquehanna River at Harrisburg, Pennsylvania.....	24,100	34,200	* 58,960	191	50	31	20	...	
01646500	Potomac River near Washington, District of Columbia...	11,560	11,070	* 121,000	218	96	...	...	...
02105500	Cape Fear River at William O. Huske Lock, near Tarheel, North Carolina.	4,852	4,933	2,570	68	0	...	...	...
02131000	Pee Dee River at Peedee, South Carolina.....	8,830	9,903	7,145	84	90	9,790	6,330	31	
02226000	Altamaha River at Doctortown, Georgia.....	13,600	13,570	7,608	92	62	9,140	5,910	31	
02320500	Suwannee River at Branford, Florida.....	7,880	7,038	† 2,627	82	-3	2,920	1,890	31	
02358000	Apalachicola River at Chattahoochee, Florida.....	17,200	22,137	15,220	85	13	16,000	10,300	31	
02467000	Tombigbee River at Demopolis lock and dam, near Coatopa, Alabama.	15,385	23,700	13,670	64	83	20,000	13,000	31	
02489500	Pearl River near Bogalusa, Louisiana.....	6,573	10,102	7,558	92	-42	6,120	3,960	31	
03049500	Allegheny River at Natrona, Pennsylvania.....	11,410	119,690	131,000	115	-5	7,600	4,910	31	
03085000	Monongahela River at Braddock, Pennsylvania.....	7,337	112,540	118,600	126	24	11,400	7,370	31	
03193000	Kanawha River at Kanawha Falls, West Virginia.....	8,367	12,550	15,970	118	67	10,400	6,720	31	
03234500	Scioto River at Higby, Ohio.....	5,131	4,654	5,641	123	-1	1,580	1,020	31	
03294500	Ohio River at Louisville, Kentucky ²	91,170	115,900	* 189,000	146	25	80,300	51,900	31	
03377500	Wabash River at Mount Carmel, Illinois.....	28,635	27,880	* 56,080	222	-36	27,500	17,800	31	
04084500	Fox River at Rapide Croche Dam, near Wrightstown, Wisconsin ²	6,010	4,248	4,560	115	-23	4,210	2,720	31	
04264331	St. Lawrence River at Cornwall, Ontario, near Massena, New York ³	298,800	245,300	259,000	102	1	220,000	142,000	31	
02NG001	St. Maurice River at Grand Mere, Quebec.....	16,300	124,290	...	...	...	...	...	...
05082500	Red River of the North at Grand Forks, North Dakota...	30,100	2,565	* 1,915	147	-9	1,680	1,080	31	
05133500	Rainy River at Manitou Rapids, Minnesota.....	19,400	9,036	9,900	98	-21	6,600	4,270	31	
05330000	Minnesota River near Jordan, Minnesota.....	16,200	7,062	* 4,843	604	0	4,200	2,710	31	
05331000	Mississippi River at St. Paul, Minnesota.....	36,800	115,890	* 113,070	232	-5	11,600	7,500	31	
05365500	Chippewa River at Chippewa Falls, Wisconsin.....	5,650	5,072	3,490	98	5	2,800	1,810	30	
05407000	Wisconsin River at Muscoda, Wisconsin.....	10,400	8,666	7,050	101	-17	8,410	5,440	24	
05446500	Rock River near Joslin, Illinois.....	9,549	6,161	7,189	141	8	10,600	6,850	31	
05474500	Mississippi River at Keokuk, Iowa.....	119,000	64,070	58,550	123	-14	36,500	23,600	31	
06214500	Yellowstone River at Billings, Montana.....	11,795	6,965	2,700	88	-15	2,470	1,600	31	
06934500	Missouri River at Hermann, Missouri.....	524,200	76,940	* 94,280	180	-32	75,900	49,000	31	
07289000	Mississippi River at Vicksburg, Mississippi ⁴	1,140,500	583,000	* 927,100	168	42	663,000	428,000	30	
07331000	Washita River near Dickson, Oklahoma.....	7,202	1,584	* 1,769	350	134	459	296	31	
08276500	Rio Grande below Taos Junction Bridge, near Taos, New Mexico.	9,730	757	* 565	118	8	525	339	31	
09315000	Green River at Green River, Utah.....	44,850	6,292	3,471	103	-3	...	...	...
11425500	Sacramento River at Verona, California.....	21,251	18,810	18,560	95	68	...	...	...
13269000	Snake River at Weiser, Idaho.....	69,200	18,220	† 12,900	80	5	13,000	8,400	31	
13317000	Salmon River at White Bird, Idaho.....	13,550	11,160	† 3,690	82	-3	3,570	2,310	31	
13342500	Clearwater River at Spalding, Idaho.....	9,570	15,290	† 3,280	51	23	2,950	1,910	31	
14105700	Columbia River at The Dalles, Oregon ⁵	237,000	119,200	† 161,870	75	15	103,000	66,700	31	
14191000	Willamette River at Salem, Oregon.....	7,280	123,400	† 117,070	42	315	7,920	5,120	31	
15515500	Tanana River at Nenana, Alaska.....	25,600	24,200	* 10,670	147	-2	9,600	6,200	31	
08MF005	Fraser River at Hope, British Columbia.....	83,800	95,720	† 28,950	73	-23	24,400	15,800	30	

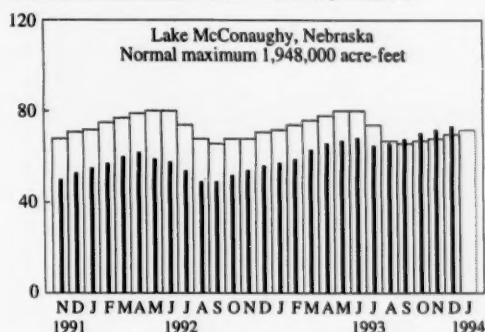
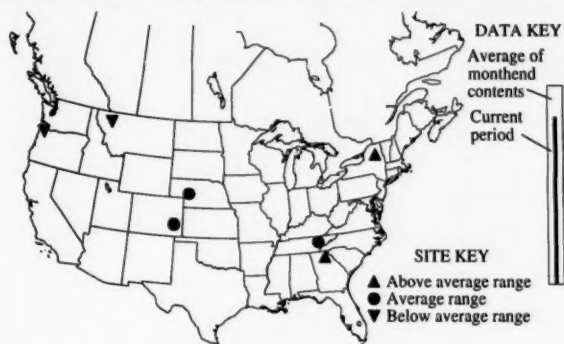
¹Adjusted.²Records furnished by Corps of Engineers.³Records furnished by Buffalo District, Corps of Engineers, through International St. Lawrence River Board of Control. Discharges shown are considered to be the same as discharge at Ogdensburg, N.Y., when adjusted for storage in Lake St. Lawrence.⁴Records of daily discharge computed jointly by Corps of Engineers and Geological Survey.⁵Discharge determined from information furnished by Bureau of Reclamation, Corps of Engineers, and Geological Survey.

* Above-normal range

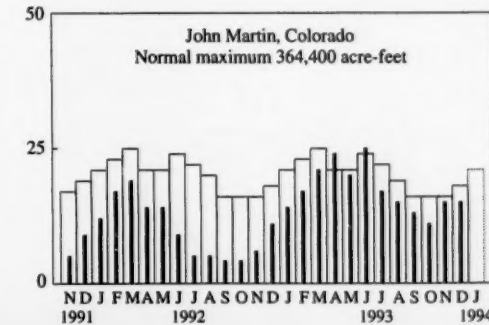
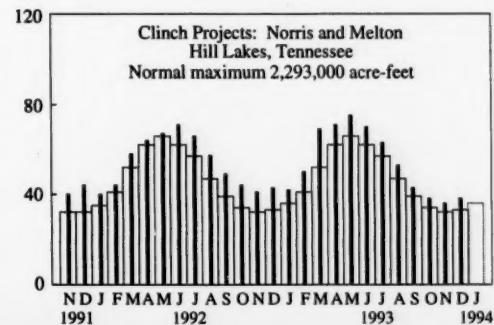
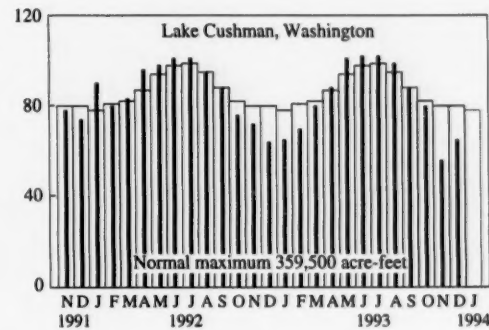
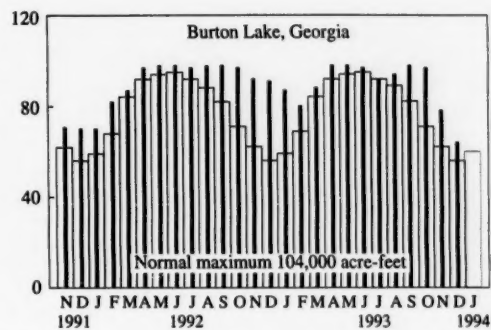
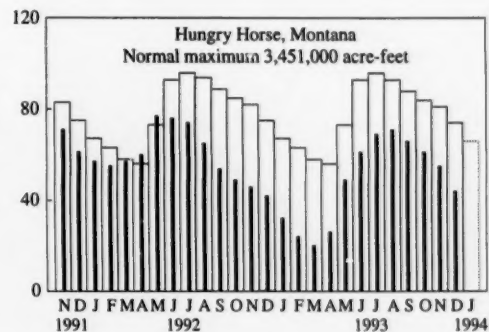
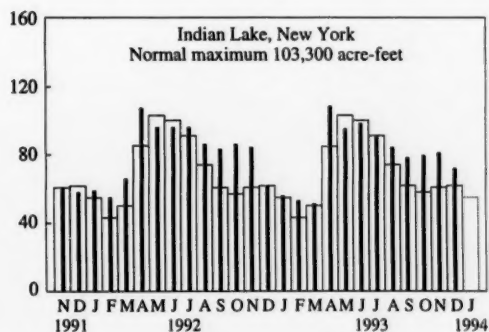
† Below-normal range

USABLE CONTENTS OF SELECTED RESERVOIRS NEAR END OF DECEMBER 1993

[Contents are expressed in percent of reservoir (system) capacity. The usable capacity of each reservoir (system) is shown in the column headed "Normal maximum" in the table [Usable contents of selected reservoir systems.](#)]



PERCENT OF NORMAL MAXIMUM



USABLE CONTENTS OF SELECTED RESERVOIRS AND RESERVOIR SYSTEMS NEAR END OF DECEMBER 1993

[Contents are expressed in percent of reservoir or reservoir system capacity. The usable capacity of each reservoir or reservoir system is shown in the column headed "Normal maximum"]

Reservoir or reservoir system						Reservoir or reservoir system					
Principal uses:						Principal uses:					
F-Flood control						F-Flood control					
I-Irrigation						I-Irrigation					
M-Municipal						M-Municipal					
P-Power						P-Power					
R-Recreation						R-Recreation					
W-Industrial						W-Industrial					
Percent of normal maximum						Percent of normal maximum					
End of	End of	Average	End of	Normal		End of	End of	Average	End of	Normal	
December	December	for	November	maximum		December	December	for	November	maximum	
1993	1992	end of	1993	(acre-feet) ¹		1993	1992	end of	1993	(acre-feet) ¹	
NOVA SCOTIA											
Rossignol, Mulgrave, Falls Lake, St. Margaret's Bay, Black, and Ponhook reservoirs (P).....	* 62	42	50	49	2,226,300	NEBRASKA					
QUEBEC						Lake McConaughy (IP)	73	56	70	72	1,948,000
Allard (P) .....	...	76	58	90	280,600	OKLAHOMA					
Gouin (P) .....	...	91	66	96	6,954,000	Eufaula Lake (FPR).....	* 98	135	91	94	2,378,000
MAINE						Keystone Lake (FPR).....	† 85	168	95	81	661,000
Seven reservoir systems (MP)	* 78	56	57	71	4,146,000	Tenkiller Ferry Lake (FPR).....	* 104	148	97	105	628,200
NEW HAMPSHIRE						Lake Altus (FIMR).....	* 59	87	51	58	133,000
First Connecticut Lake (P)	* 66	64	59	66	76,450	Lake O'The Cherokees (FPR).....	* 91	117	83	95	1,492,000
Lake Francis (FPR).....	* 85	73	71	85	99,310	OKLAHOMA-TEXAS					
Lake Winnepesaukee (PR).....	* 73	58	63	67	165,700	Lake Texoma (FIMPRW).....	97	108	92	97	2,722,000
VERMONT						TEXAS					
Harriman (P)	* 81	71	61	81	116,200	Bridgeport (IMW).....	* 94	91	51	93	386,400
Somerset (P)	* 81	77	69	81	57,390	Canyon Lake (FMR).....	* 95	99	83	96	385,600
MASSACHUSETTS						International Amistad (FIMPRW).....	86	98	87	88	3,497,000
Cobble Mountain and Borden Brook (MP).....	75	95	73	65	77,920	International Falcon (FIMPRW).....	† 64	99	79	63	2,668,000
NEW YORK						Livingston (IMW).....	* 100	101	91	100	1,788,000
Great Sacandaga Lake (FPR).....	* 61	71	54	56	786,700	Possum Kingdom Lake (IMPRW).....	† 32	88	95	82	570,200
Indian Lake (FMP).....	* 72	62	62	81	103,300	Red Bluff (P).....	† 83	49	31	32	307,000
New York City reservoir system (MW).....	† 63	72	78	53	1,680,000	Toledo Bend (P).....	† 77	91	84	75	4,472,000
NEW JERSEY						Twin Buttes (FIM).....	* 59	79	37	54	177,800
Wanaque (M).....	* 82	83	73	50	85,100	Lake Kemp (IMW).....	† 78	89	85	76	268,000
PENNSYLVANIA						Lake Meredith (FMW).....	34	40	37	34	796,900
Allegheny (FPR).....	† 26	30	33	32	1,180,000	Lake Travis (FIMPRW).....	79	98	81	79	1,144,000
Pymatung (FMR).....	80	81	82	89	188,000	MONTANA					
Raystown Lake (FR).....	* 68	68	59	72	761,900	Canyon Ferry Lake (FIMPR).....	84	76	84	89	2,043,000
Lake Wallenpaupack (PR).....	* 70	70	58	79	157,800	Fort Peck Lake (FPR).....	77	56	82	77	18,910,000
MARYLAND						Hungry Horse (FIPR).....	† 44	42	74	55	3,451,000
Baltimore Municipal System (M)	* 99	78	83	97	61,900	WASHINGTON					
NORTH CAROLINA						Ross (PR).....	64	29	69	72	1,052,000
Bridgewater (Lake James) (P).....	* 91	95	79	91	288,800	Franklin D. Roosevelt Lake (IP).....	89	77	92	81	5,022,000
Narrows (Bald Lake) (P).....	95	96	93	96	128,900	Lake Chelan (P).....	52	50	56	65	676,100
High Rock Lake (P).....	† 51	66	60	51	234,800	Lake Cushman (PR).....	† 65	64	80	56	359,500
SOUTH CAROLINA						Lake Merwin (P).....	100	100	96	98	245,600
Lake Murray (P).....	* 73	86	63	75	1,614,000	IDAHO					
Lake Marion and Lake Moultrie (P).....	* 73	89	62	80	1,777,000	Boise River (4 reservoirs) (FIP).....	54	18	53	53	1,235,000
SOUTH CAROLINA-GEORGIA						Coeur d'Alene Lake (P).....	† 26	16	54	40	238,500
Strom Thurmond Lake (FP).....	* 64	82	53	57	1,730,000	Pend Oreille Lake (FP).....	† 40	36	47	32	1,561,000
GEORGIA						IDAHO-WYOMING					
Burton Lake (FR).....	* 64	91	56	78	104,000	Upper Snake River (8 reservoirs) (MP).....	* 75	33	58	69	4,401,000
Sinclair (MFR).....	* 90	90	77	88	214,000	WYOMING					
Lake Sidney Lanier (FIMPR).....	† 41	67	50	41	1,686,000	Boysen (FIP).....	* 83	72	75	86	802,000
ALABAMA						Buffalo Bill (IP).....	* 59	65	43	60	646,600
Lake Martin (P).....	* 73	90	62	80	1,375,000	Keyhole (P).....	36	10	39	35	193,800
TENNESSEE VALLEY						Pathfinder, Seminole, Akovva, Kortes, Glendo, and Guernsey reservoirs (I).....	45	26	47	43	3,056,000
Clinch Projects: Norris and Melton Hill Lakes (FPR).....	38	43	33	36	2,293,000	COLORADO					
Douglas Lake (FPR).....	11	21	11	14	1,395,000	John Martin (FIR).....	15	11	18	15	364,400
Hiwassee Projects: Chatuge, Nottely, Hiwassee, Apalachia, Blue Ridge, Ocoee 3, and Parkville Lakes (FPR).....	39	59	40	39	1,012,000	Taylor Park (IR).....	* 64	56	56	66	106,200
Holston Projects: South Holston, Watauga, Boone, Fort Patrick Henry, and Cherokee Lakes (FPR).....	* 45	50	34	44	2,880,000	Colorado-Big Thompson Project (I).....	* 72	55	57	72	730,300
Little Tennessee Projects: Nantahala, Thorpe, Fontana, and Chilhowee Lakes (FPR).....	* 51	67	40	51	1,478,000	COLORADO RIVER STORAGE PROJECT					
WISCONSIN						Lake Powell; Flaming Gorge, Fontenelle, Navajo, and Blue Mesa reservoirs (IFPR).....	76	59	72	78	31,620,000
Chippewa and Flambeau (PR).....	* 75	75	64	92	365,000	UTAH-IDAHO					
Wisconsin River (21 reservoirs) (PR).....	61	73	56	69	399,000	Bear Lake (IFPR).....	† 37	15	57	36	1,421,000
MINNESOTA						CALIFORNIA					
Mississippi River Headwater System (FMR).....	* 31	30	24	35	1,640,000	Folsom Lake (FIMPR).....	† 40	23	54	44	1,000,000
NORTH DAKOTA						Hetch Hetchy (MP).....	* 72	37	37	77	360,400
Lake Sakakawea (Garrison) (FIPR).....	80	57	80	80	22,700,000	Lake Isabella (FIR).....	* 43	14	26	43	568,100
SOUTH DAKOTA						Pine Flat Lake (FIR).....	† 38	7	47	35	1,001,000
Angostura (I).....	* 84	59	68	84	130,770	Clair Engle Lake (Lewiston) (FP).....	78	28	73	78	2,438,000
Belle Fourche (I).....	* 69	18	43	63	185,200	Lake Almanor (P).....	* 67	66	30	73	1,036,000
Lake Francis Case (FIP).....	58	57	39	53	4,589,000	Lake Berryessa (FIMPRW).....	† 48	28	79	47	1,600,000
Lake Oahe (FIP).....	* 87	65	64	88	22,240,000	Millerton Lake (FI).....	† 44	35	54	34	503,200
Lake Sharpe (FIP).....	99	100	99	100	1,697,000	Shasta Lake (FIPR).....	68	46	68	67	4,377,000
Lewis and Clark Lake (FIP).....	† 89	91	100	91	432,000	CALIFORNIA-NEVADA					
						Lake Tahoe (IMPRW).....	† 0	0	46	0	744,600
						NEVADA					
						Rye Patch (I).....	† 9	1	44	7	194,300
						ARIZONA-NEVADA					
						Lake Mead and Lake Mohave (FIMP).....	* 82	77	72	81	27,970,000
						ARIZONA					
						San Carlos (IP).....	* 56	66	24	56	935,100
						Salt and Verde River System (IMPR).....	* 69	76	43	69	2,019,100
						NEW MEXICO					
						Conchas (FIR).....	78	73	82	78	315,700
						Elephant Butte and Caballo (FIPR).....	* 88	79	41	85	2,394,000

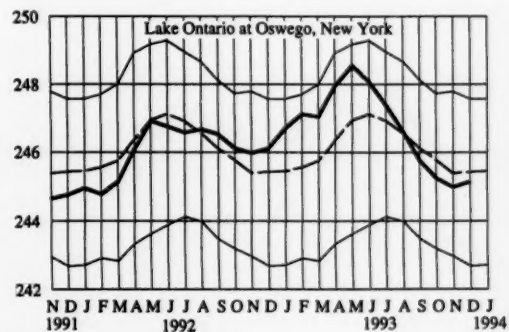
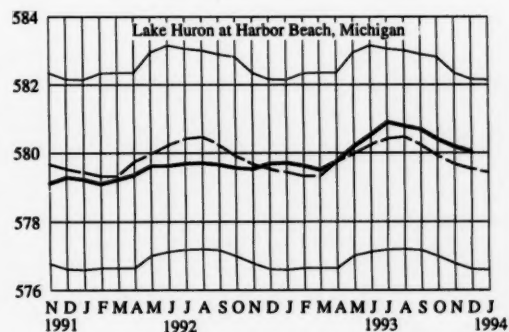
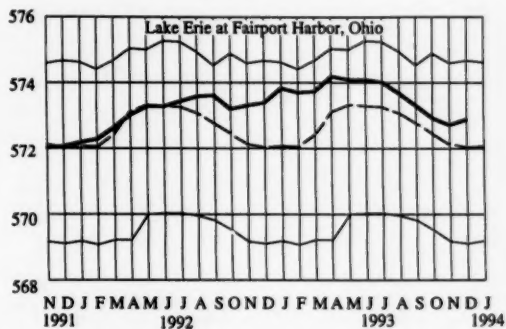
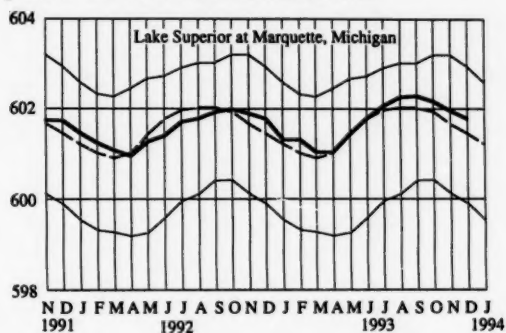
¹ 1 acre-foot = 0.04356 million cubic feet = 0.326 million gallons = 0.504 cubic feet per second per day.² Thousands of kilowatt-hours (the potential electric power that could be generated by the volume of water in storage).

* Above-average range

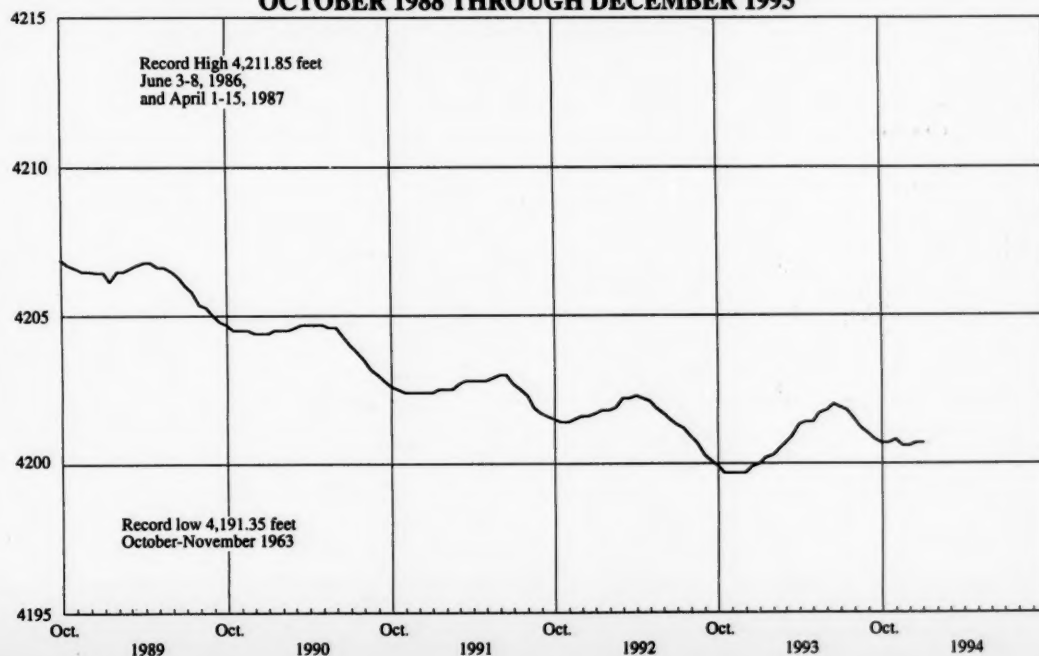
† Below-average range

GREAT LAKES ELEVATIONS

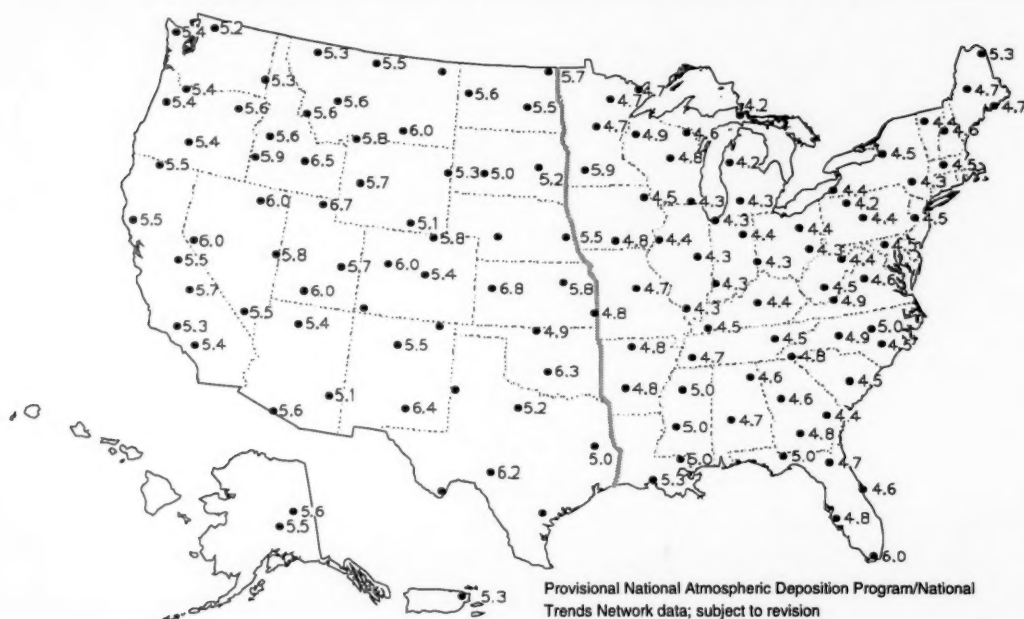
Area between light-weight solid lines indicates range between highest and lowest record for the month. Dashed line indicates median of monthly values for reference period 1961-90. Heavy line indicates mean for current period. Data from National Ocean Service.



FLUCTUATIONS OF THE GREAT SALT LAKE, OCTOBER 1988 THROUGH DECEMBER 1993



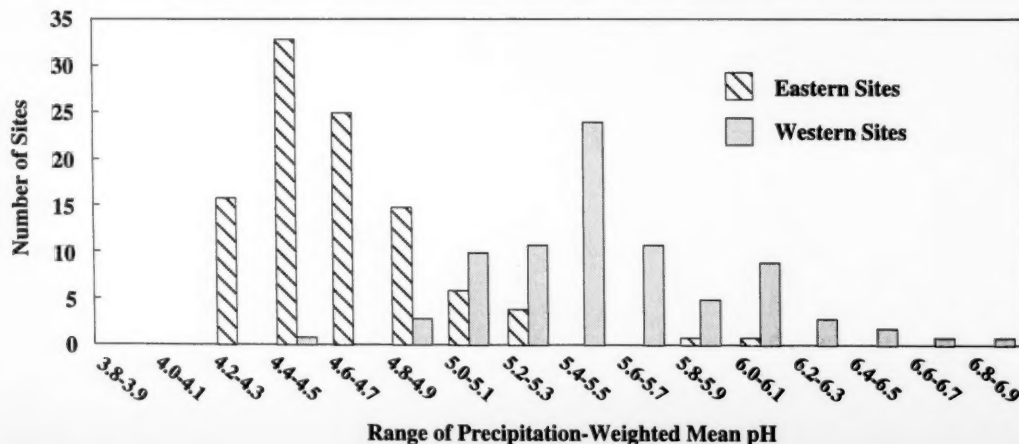
pH of Precipitation for November 22-December 26, 1993



Current pH data shown on the map (• 4.9) are precipitation-weighted means calculated from preliminary laboratory results provided by the NADP/NTN Central Analytical Laboratory at the Illinois State Water Survey and are subject to change. The 129 points (•) shown on this map represent a subset of all sites chosen to provide relatively even geographic spacing. Absence of a pH value at a site indicates either that there was no precipitation or that data for the site did not meet preliminary screening criteria for this provisional report.

A list of the approximately 200 sites comprising the total Network and additional data for the sites are available from the NADP/NTN Coordination Office, Natural Resource Ecology Laboratory, Colorado State University, Fort Collins, CO 80523.

Distribution of precipitation-weighted mean pH for all NADP/NTN sites having one or more weekly samples for November 22-December 26, 1993. The East/West dividing line is at the western borders of Minnesota, Iowa, Missouri, Arkansas, and Louisiana.



NATIONAL WATER CONDITIONS

DECEMBER 1993

Based on reports from the Canadian and U.S. Field offices; completed April 25, 1994

TECHNICAL STAFF

James R. Kolva, Editor
Krishnaveni V. Sarma
Donald J. Dolnick

COPY PREPARATION

Kristina L. Herzog

GRAPHICS

Krishnaveni V. Sarma
Kristina L. Herzog

Page showing pH of precipitation data furnished by Office of Atmospheric Deposition.

The *National Water Conditions* is published monthly. Subscriptions are free on application to the U.S. Geological Survey, 419 National Center, Reston, VA 22092.

EXPLANATION OF DATA (Revised April 1994)

Cover map shows generalized pattern of streamflow for the month based on provisional data from 186 index gaging stations—18 in Canada, 166 in the United States, and 2 in the Commonwealth of Puerto Rico. Alaska, Hawaii, and Puerto Rico inset maps show streamflow only at the index gaging stations that are located near the point shown by the arrows. Classifications on map are based on comparison of streamflow for the current month at each index station with the flow for the same month in the 30-year reference period, 1961-90. Shorter reference periods are used for one index station in Utah and both of the Puerto Rico index stations. Streamflow data presented herein are those published in the annual series of U.S. Geological Survey reports titled *Water Resources Data* (State) through the end of the 1992 water year—September 30, 1992. All other data are provisional.

The comparative data are obtained by ranking the 30 flows for each month of the reference period in order of decreasing magnitude—the highest flow is given a ranking of 1 and the lowest flow is given a ranking of 30. Quartiles (25-percent points) are computed by weighted averaging of the 7th and 8th highest flows (upper quartile), 15th and 16th highest flows (middle quartile or median), and the 23rd and 24th highest flows (lower quartile). The upper and lower quartiles set off the highest and lowest 25 percent of flows, respectively, for the reference period. The median (middle quartile) is the middle value by definition. For the reference period, 50 percent of the flows are greater than the median, 50 percent are less than the median, 50 percent are between the upper and lower quartiles (in the normal range), 25 percent are greater than the upper quartile (above normal), and 25 percent are less than the lower quartile (below normal). Flow for the current month is then classified as: in the **above-normal**

range if it is greater than the upper quartile, in the **normal range** if it is between the upper and lower quartiles, and in the **below-normal range** if it is less than the lower quartile. Change in flow from the previous month to the current month is classified as **seasonal** if the change is in the same direction as the change in the median. If the change is in the opposite direction of the change in the median, the change is classified as **contraseasonal**. For example: at a particular index station, the January median is greater than the December median; if flow for the current January increased from December (the previous month), the increase is seasonal; if flow for the current January decreased from December, the decrease is contraseasonal.

Flood frequency analyses define the relation of flood peak magnitude to probability of occurrence or recurrence interval. **Probability of occurrence** is the chance that a given flood magnitude will be exceeded in any one year. **Recurrence interval** is the reciprocal of probability of occurrence and is the average number of years between occurrences. For example, a flood having a probability of occurrence of 0.01 (1 percent) has a recurrence interval of 100 years. **Recurrence intervals imply no regularity of occurrence**; a 100-year flood might be exceeded in consecutive years or it might not be exceeded in a 100-year period.

Dissolved solids and temperature data are given for two stream-sampling sites that are part of the National Stream Quality Accounting Network (NASQAN). **Dissolved solids** are minerals dissolved in water and usually consist predominantly of silica and ions of calcium, magnesium, sodium, potassium, carbonate, bicarbonate, sulfate, chloride, and nitrate. **Dissolved-solids discharge** represents the total daily amount of dissolved minerals carried by the stream. **Dissolved-solids concentrations** are generally higher during periods of low streamflow, but the highest dissolved-solids discharges occur during periods of high streamflow because the total quantities of water, and therefore total load of dissolved minerals, are so much greater than at times of low flow.

FACTORS FOR CONVERTING INCH-POUND UNITS TO INTERNATIONAL SYSTEM UNITS (SI)

Multiply inch-pound units	By	To obtain SI units
<i>Length</i>		
inches	2.54×10^1	millimeters (mm)
	2.54×10^{-2}	meters (m)
feet	3.048×10^{-1}	meters (m)
miles	1.609×10^3	kilometers (km)
<i>Area</i>		
square miles	2.590×10^9	square kilometers (km ²)
<i>Volume</i>		
acre-feet (acre-feet)	1.233×10^{-3}	cubic hectometers (hm ³)
	1.233×10^{-6}	cubic hectometers (km ³)
<i>Flow</i>		
cubic feet per second (ft ³ /s)	2.832×10^{-1}	cubic meters per second (m ³ /s)

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